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I.

A REVISION OF THE NORTH AMERICAN SPECIES  
OF THE GENUS OXYTROPIS, DC.

BY ASA GRAY.

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IN the sixth volume of the Proceedings of the American Academy (1863), as an appendix to a revision of *Astragalus*, I made an attempt to classify and characterize our comparatively few species of *Oxytropis*. In the autumn of 1880, I compared our own materials with those in the Kew herbarium, but, unfortunately, without knowing of Bunge's *Species Generis Oxytropis*, which was communicated to the Imperial Academy of Sciences of St. Petersburg in November, 1873, and published in its *Mémoires*, Ser. VII. Vol. XXII., in 1874. Bunge cites my notes, but he had not the means for clearing up the obscurities. Even now, after some examination of most of the originals, I can only partially remove them. But the subjoined synopsis may fairly represent our present knowledge.

OXYTROPIS, DC.

§ 1. Caulescens, nunc subcaulescens; stipulis inter se et a petiolo liberis: legumen uniloculare calycem longe superans. — Subgen. *Phacoxytropis* § *Mesogææ*, Bunge.

1. *O. DEFLEXA*, DC. *O. foliolosa*, Hook. (*O. foliosa*, in Torr. & Gray, Fl.), forma subcaulis. — Saskatchewan, and along the Rocky Mountains to S. Colorado. (N. Asia.)

§ 2. *Acaulescens* vel *subcaulescens*; caudicibus *multicipitibus* conferte foliosis, stipulis petiolo adnatis: folia simpliciter pinnata.

\* Legumen calyce fructifero ovato-globoso vesicario prorsus inclusum, ovatum, uniloculare: pedunculi debiles 1-2-flori. — § *Physocalyx*, Nutt. § *Calycophysæ*, Gray, Proc. Am. Acad. vi. 234. Subgen. *Physoxytropis*, Bunge, Oxytr. 161.

2. O. *MULTICEPS*, Nutt. in Torr. & Gray, Fl. i. 341. — Rocky Mountains of Wyoming, *Nuttall*, in fruit only.

Var. *MINOR*. Pulvinato-cæspitosa, depressa; foliolis minoribus lin. 1-3 longis. — O. *multiceps*, Gray, Proc. Acad. Philad., 1863, 61; Proc. Am. Acad. vi. 234. — Alpine region of the Rocky Mountains, S. Wyoming and Colorado, *Parry, Hall & Harbour, Vasey, Coulter, &c.* Leaflets about half the size of those of *Nuttall*'s original, and fruiting calyx rather smaller. No quite intermediate specimens have yet been found.

\* \* Legumen calyce fructifero repleto vel hinc fisso parum longius, turgidum, pubescens, sutura ventrali introflexa semi-bilocellatum: scapi folia superantes, capitato-pluri- vel pauci-flori: plantæ albo-sericeæ, spithamææ: flores ultra semipollicares, bracteis majusculis.

3. O. *NANA*, Nutt. l. c. Pube adpressa argenteo-sericea; foliolis 3-4-rarius 6-jugis angusto-lanceolatis; corolla purpurea vel pallida; legumine turgido-oblongo subcoriaceo, apice acuminato e calyce fructifero tenuiter villosi distento sed integro parum exserto. — Rocky Mountains of Wyoming, on stony hills along the branches of the Platte, *Nuttall, Geyer*, the latter under the name of *O. multiceps* in Hook. Lond. Jour. Bot. N. W. Wyoming, *Parry*, no. 91 & 90, along with a larger form, with the inflorescence in fruit sometimes oblong; the same collected by *Dr. Forwood*. S. Montana, *S. Watson*, who notes that the flowers are "deep pink." This may be *O. argentata* of Pursh. Fl. 473.

4. O. *LAGOPUS*, Nutt., Jour. Acad. Philad. vii. 17. Pilis laxioribus albo-sericea; foliolis 4-5-jugis lanceolatis vel oblongis; corolla læte violacea; legumine ovato subvesicario fere membranaceo obtuso stylo subito rostrato calycem villosissimum mox fissum parum superante. — Rocky Mountains of Wyoming and Montana, *Wyeth, Howard, Parry* (no. 92), *Greene, Scribner*.

\* \* \* Legumen basi tantum calyce aut integro aut hinc fisso suffultum,

+ Vesicario-inflatum membranaceum, ovatum, uniloculare: scapi vel pedunculi debiles, pauciflori, fructiferi mox decumbentes: herbæ

nanæ, cæspitoso-depressæ. — § *Physocarpæ*, Gray, Proc. Am. Acad. vi. 234.

5. *O. PODOCARPA*, Gray, l. c. Villosa, mox glabrescens; foliolis 5-11-jugis lineari-lanceolatis (lin. 3-4-longis); pedunculis folia haud superantibus bifloris; floribus majusculis (lin. 7-8 longis); corolla violacea; legumine amplo (sæpius pollicem longo) lato-ovato puberulo brevi-stipitato, sutura ventrali intrusa. — *O. arctica*, var. *inflata*, Hook. Fl. Bor.-Am. i. 146. *O. Hallii*, Bunge, Oxytr. 162, described from a specimen barely in flower, appears to be of this species. — Alpine and subalpine in the Rocky Mountains, from S. Colorado (*J. M. Coulter, Greene, Brandegee, Hall & Harbour, &c.*) to British America (*Drummond, Burke, Bourgeau, Macoun*); and from Labrador to the Aleutian Islands; but specimens from the latter not in fruit, therefore uncertain. The stipe of the legume is variable, sometimes very short, perhaps never quite equalling the calyx.

6. *O. OREOPHILA*. Sericeo-canescens; foliolis 3-5-jugis lanceolatis oblongisve (lin. 2-4 longis); scapis folia plerumque superantibus capitato-4-8-floris; floribus parvulis (lin. 4-5-longis); corolla ut videtur purpurea; legumine haud stipitato oblongo-ovato griseo-pubescente vix semipollicari, sutura ventrali subintrusa. — Mountains of Utah (Aquarius Plateau at nearly 10,000 feet, *L. F. Ward*, in 1875), and on Grayback Mountain, San Bernardino Co., S. California, at 9,000-12,000 feet, *W. G. Wright, Lemmon*, in 1879-80.

A possible variety of this, or a related species, with flowers almost immersed in the tufts of foliage, was collected in Rabbit Valley, Utah, by Mr. Ward (no. 574), but only in blossom.

+ + Legumen obcompressum, lanceolato-oblongum, tenui-chartaceum, sæpius nigricanti-pilosum, suturis utrisque intrusis fere bilocellatum: pedunculi 1-2- (raro 3-) flori, breves vel brevissimi in caudicibus nanis foliosissimis.

7. *O. NIGRESCENS*, Fischer in DC. Prodr. ii. 278. *Astragalus nigrescens* (large form) & *A. pygmæus*, Pall. Astrag. t. 53, 54. — Arctic coast, especially on the Asiatic side; coll. by *C. Wright* on Arakamschetchene Island within Behring Strait; and by *J. Muir* on Cape Thompson, on the American side.

Var. *ARCTOBIA*. Pumila, pulvinato-depressa, albo-villosa; pedunculis unifloris; pube calycis et leguminis aut griseo-albida aut nigra. — *O. arctica*, var., R. Br. in Parry, Voy. *O. arctica*, var. minor, Hook. in Parry, 2d Voy. 396, & Fl. Bor.-Am. i. 146. *O. arctobia*, Bunge, Oxytr. 114, excl. syn. Nutt. — Arctic sea-coast, coll. Admiral Parry and most later explorers. Evidently passes into *O. nigrescens*.

+ + Legumen fere teres, turgidum, sæpius hinc sulcatum, chartaceum vel coriaceum: scapi sat elongati, 1-4-flori.

= Foliola plurijuga: legumen angusto-oblongum, haud stipitatum, septo e sutura ventrali introflexo bilocellatum.

8. *O. PARRYI*. Sericeo-canescens; foliis scapisque 1-2-floris demum spithamæis; foliolis 7-9-jugis oblongo-lanceolatis lin. 2-3 longis; calyce brevi griseo-pubescente, dentibus tubo campanulato æquilongo: legumine (lin. 5-6 longo) hinc profunde sulcato pube brevi griseo. — Rocky Mountains of Northern New Mexico and Colorado, near the limit of trees, *Parry, Hall & Harbour, Greene*, with mature fruit in July: flowers not seen. Was named by me *O. arctica* in Hall & Harbour's collection, no. 143, and *O. Uralensis*, var. *pumila*, in Proc. Am. Acad. vi. 235, and *O. Lagopus*, Nutt., was wrongly referred to it. From the references this would seem to be the plant described as *O. arctica* by Bunge, Oxytr. 97, but his character does not accord with Hall & Harbour's specimens, which want the flowers, and are very different from Brown's plant (which I now know). It would seem that Bunge's description was drawn partly from Hall & Harbour's specimens, partly from Brown's character of *O. arctica*, and partly from that of *O. Lagopus*, Nutt., which I had very wrongly adduced to Brown's species.

= = Foliola 4-6-juga, villosa-sericea: legumen ovato-oblongum, haud stipitatum, semibilocellatum, cum calyce sæpius nigricanti-pubescent: scapi folia superantes, capitato-2-5-flori.

9. *O. ARCTICA*, R. Br. App. Parry Voy. 278 (non 309); Hook. Fl. Bor.-Am. l. c., excl.  $\beta$  &  $\delta$ . *O. Uralensis*, var. *arctica*, Ledeb. Fl. Ross. i. 594. Probably also *O. Uralensis*, var. *pumila*, Ledeb. l. c. — Arctic sea-coast, coll. first in Admiral Parry's voyage, also by Richardson and by later arctic explorers. Certainly not a form of *O. Uralensis*; the stipules destitute of the nervation of that species, having only a midnerve and one or two recurving veins. Plant quite unlike the forms of *O. nigrescens* and *O. podocarpa*, which have been referred to it.

= = = Foliola aut 3-5, aut solitaria; legumen oblongo-ovatum, brevi-stipitatum, nigricanti-pubescent, sutura ventrali intrusa vix semi-bilocellatum: scapi folia superantes, 1-4-flori.

10. *O. MERTENSIANA*, Turcz., Ledeb., Bunge, Oxytr. 116. — I have fruiting specimens of this from Arakamtschetchene Island, on the Asiatic side, within Behring Strait, collected by *C. Wright*. From my notes made in the Kew herbarium, I am disposed to consign to it, rather than to *O. arctica*, the specimens referred to the latter species by Seemann

(Bot. Herald, 28), collected by him at Cape Lisburne, on the American side, in flower only. Captain Pullen's plant, collected west of Cape Bathurst, seemed to be the true *O. arctica*, R. Br.

+ + + + Legumen fere teres, turgidum, hinc vel utrinque sulcatum, chartaceum vel coriaceum: scapi capitato- vel spicato-pluriflori, folia plurifoliolata æquantēs vel superantes: stipulæ in nostris uninerviæ, rarius apice acuminato subtrinerviæ. Species perdifficiles.

++ Aut pube villosa aut glandulis sessilibus pl. m. viscosa, saltem calyces: foliola vel glabella vel villosa mox glabrata, viridia, nunquam sericea: legumen oblongum, haud stipitatum, tenui-chartaceum, sutura ventrali introflexa semi- vel sub-bilocellatum.

11. *O. VISCIDA*, Nutt. in Torr. & Gray, Fl. i. 341. Floribus in capitulum oblongum demumve spicam tripollicarem congestis; calyce brevi-campanulato pilis albidis vel griseis villosis; legumine parvulo (lin. 3-5 longo) tantum puberulo stylo recto tenui-rostrato. — Rocky Mountains, from the British Possessions to Colorado and N. Nevada; common in Wyoming. The small projecting glands which give the viscosity are sometimes conspicuous on petioles, scapes, bracts, and calyx, and even on the legume, but in many dried specimens they are hardly to be detected. Flowers about 5 lines long: corolla probably not ochroleucous, sometimes apparently white with either the tip of the keel or lamina of wings and standard violet. The species is well represented by no. 89 of Parry's N. W. Wyoming collection; also by his no. 88, in flower only, and by no. 292 of Watson's collection in King's Exploration. Northward it was collected by Bourgeau (distrib. as *O. campestris*?), and by Macoun, at Bow River Pass.

12. *O. LEUCANTHA*, Pers. Syn. ii. 331; Bunge, Oxytr. 111. *O. borealis*, & *O. leucantha*, DC. Capitulum etiam fructifero brevi parum oblongo; calyce oblongo-campanulato pilis nigris albidisque villosis; legumine ventricosissimo ¾-pollicari nigricanti-villosissimo stylo mox recurvato rostrato. — Specimens of this from C. Wright's collection on Arakamt-schetchene Island, on the Asiatic side of Behring Strait, have been so named by Bunge, and they accord with the figure of *Astragalus leucanthus* in Pall. Astrag. t. 47. Not a good name, the corollas being, as in the figure, well suffused with violet. Stouter forms of it were collected by Seemann on the American side, perhaps white-flowered; and a form with white-haired calyx was collected at Cape Thompson, &c. by Muir. A part of *O. campestris* of Hook. Fl. Bor.-Am. must also be of this species. Although placed among the glandular-viscid species by Bunge, the glandulosity is obscure, and in some specimens not apparent. Occasionally the long hairs of the calyx seem to be viscous.

++ ++ Nec glandulosa nec viscida : legumen haud vel vix stipitatum.

13. *O. CAMPESTRIS*, L., var. *CÆRULEA*, Koch. Sæpius nana; foliis viridibus, maturis laxè pubescentibus vel glabris parvulis (lin. 3-4 rarius 5-6 longis); floribus etiam fructibus capitato-congestis raro in spica laxiuscula parum dissitis; corolla cærulea albo-cærulea nunc plane alba semipollicari; legumine semipollicari membranaceo-chartaceo turgide ovato seu oblongo semi- vel sub-bilocellato nigricanti-puberulo. — Northern Maine, Lower Canada, (near Quebec, &c.), and Labrador. These are the only American stations I can cite for *O. campestris*, taking that species to comprise *O. sordida*. And as our specimens have clear violet or blue corollas, when not pure white (as some few are completely), I adopt Koch's name given to the quite similar form in Europe. The stipules are either simply one-nerved, or some with a triple nerve at the apex, differing in this particular in the same plant. A slight introflexion of the dorsal suture is apparent in the legumes of the South Labrador specimens collected by Dr. Allen.

14. *O. MONTICOLA*. Laxe villososericea, nunc subglabrata, spithamæa ad pedalem; foliolis oblongis vel lanceolatis (lin. 3-7 longis); spica oblonga vel cylindræa etiam fructifera conferta; corolla aut violaceo-purpurea aut ochroleuca vix semipollicari; legumine ovato-oblongo recte acuminato membranaceo-chartaceo lin. 4-6 longo aut prorsus uniloculari aut sutura ventrali introflexa semibiloculari pube brevi albido-sericeo calycem campanulatum vix ultra dimidium superante. — Northern Rocky Mountains; viz. Wyoming and Montana, *Parry*, no. 87, *Canby*; Dakota, coll. *Jenney*, but in flower only. Rocky Mountains in British Possessions, *Bourgeau*, with fruit, *Lyall*, in flower only; and Spy Hill, *Macoun*, 1879, no. 107, in fruit. Probably some of this species is included in *O. campestris* of Hook. Fl. Bor.-Am.; but his var. *spicata* seems rather to belong to *O. Lamberti*. It is more like *O. viscida*, Nutt., but is neither glandular nor viscid. Here may belong a plant collected by *Dall* on a rocky talus in front of a glacier at Chugachik Bay, Cook's Inlet, Alaska, in flower only.

15. *O. LAMBERTI*, Pursh. Spithamæa ad sesquipedalem, pube adpressa sæpius albida vel argentea sericea, quandoque glabrata; foliis oblongo-lanceolatis linearibusque lin. 4-16 longis; spica aut brevi-oblonga densiflora aut elongata demum sparsiflora; floribus sat magnis (majoribus pollicaribus) læte violaceis vel purpureis vel albis etiam sulphureis; legumine coriaceo oblongo sub-bilocellato sericeo-puberulo (stipite aut plane nullo aut brevissimo) nunc semipollicari turgido calycem haud ultra dimidium superante nunc subpollicari magis ex-

serto. — Sims, Bot. Mag. t. 2148; Lindl. Bot. Rgs. t. 1054; both good figures. *O. Lamberti*, *sericea*, *Plattensis*, & *Hookeriana*, Nutt. in Torr. & Gray, Fl. i. 339, 340. — Plains of the Saskatchewan and Minnesota to W. Texas and New Mexico, west to Montana, British Columbia, Utah, &c. The yellowish-flowered and the purple or violet forms often growing side by side.

Var. *SERICEA* (*O. sericea*, Nutt. in Torr. & Gray, l. c.) is sometimes well marked, as a robust form, with broader leaflets (from lanceolate to oblong, and 3 or 4 lines wide), and cylindraceous legumes nearly or quite an inch long; the pubescence of the leaflets very silky: but these characters very variable. It abounds from the mountains of Wyoming to those of Texas and Arizona, and to the eastern borders of California. A form with slender legumes passes into

Var. *BIGELOWII*. Legumes distinctly stipitate in the calyx, slender (an inch long, including the style, only 2 lines in diameter), minutely puberulent under a lens, very thin-coriaceous: leaves narrow, green and glabrate. — *O. Lamberti*, Torr. in Pacif. R. Rep. iv. 80. — On the Upper Canadian River, in Colorado? *Bigelow*.

§ 3. *Acaulescens*; stipulis petiolo adnatis; scapis spicigeris: folia verticillato-pinnata, nempe foliolis pluribus quasi in fasciculis seu verticillis ordinatis. — § *Verticillares*, DC.

16. *O. SPLENDENS*, Dougl. in Hook. Fl. Bor.-Am. i. 147, cum var. *vestita* & var. *Richardsonii* (*O. oxyphylla*, Richards. non Pall.). Nitenti- (sæpius argenteo-) sericeo-villosa: legumine ovato sutura dorsali parum ventrali longe introflexa bilocellato calyce villosissimo longe angustequè 5-dentato demum hinc fisso fere incluso. — Subarctic British America to the Rocky Mountains, from Montana to Colorado and northern part of New Mexico. The specimens of *Richardson*, in which, according to Sir William Hooker, the fruit greatly exceeds the calyx in length, should be re-examined. In all ours the legume is as described above: and the beak of the keel is not so very short as *Bunge* describes it.